

CLAIMS

1. A transmitter to be connected to a receiver via a transmission line, the transmitter composing a signal transmission system together with the receiver, the transmitter comprising:

a communication section to be connected to a first end of the transmission line; and

10 transmission line with a predetermined amount of driving current, the driving current control section changing current amount of the driving current based on a control signal,

wherein, as the control signal, the communication section receives from the receiver being connected to a 15 second end of the transmission line an instruction signal for instructing whether or not to change the current amount of the driving current, the instruction signal being generated based on whether a signal value detected at the second end of the transmission line falls within a predetermined range or 20 not.

2. The transmitter of claim 1, wherein, if the signal value falls within the predetermined range, the communication section receives as the control signal an instruction signal 5 instructing to stop changing the current amount of the driving current, and based on the control signal, the driving current control section retains a present setting value of the current amount of the driving current.
- 10 3. The transmitter of claim 1, wherein, if the signal value is smaller than a lower limit value of the predetermined range, the communication section receives as the control signal an instruction signal instructing to increase the driving current, and based on the control signal, the driving 15 current control section increases the driving current.
4. The transmitter of claim 1, wherein, if the signal value is greater than an upper limit value of the predetermined range, the communication section receives as the control 20 signal an instruction signal instructing to decrease the

driving current, and based on the control signal, the driving current control section decreases the driving current.

5. The transmitter of claim 1, wherein the communication section includes a first terminal connected to the first end of the transmission line and a second terminal for being connected to a control signal line to receive the instruction signal, the control signal line being different from the transmission line.

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6. The transmitter of claim 1, wherein,

the driving current control section is capable of transmitting a signal by driving the transmission line; and transmission of a signal from the driving current control section and reception of the control signal are 15 performed by time division.

7. The transmitter of claim 1, wherein an output impedance value when the driving current control section drives the transmission line is smaller than an output impedance value 20

of the receiver outputting the instruction signal.

8. The transmitter of claim 1, wherein,

the driving current control section is capable of

5 transmitting a signal by driving the transmission line; and

a rate with which the driving current control section

transmits a signal is faster than a rate with which a signal

is transmitted when the receiver outputs the instruction

signal.

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9. The transmitter of claim 1, wherein the transmission line

is detachable from the communication section.

10. A receiver to be connected to a transmitter via a

15 transmission line, the receiver composing a signal

transmission system together with the transmitter, the

transmitter being connected to a first end of the

transmission line, the receiver comprising:

a communication section connected to a second end of the

20 transmission line, the communication section receiving a

signal from the transmission line being driven with a predetermined driving current;

a detection section for detecting a signal value at the second end of the transmission line based on the signal, and
5 for generating a detection signal indicating whether the signal value falls within a predetermined range or not; and

a signal generation section for, based on the detection signal, generating an instruction signal for instructing whether or not to change current amount of the driving
10 current, wherein

the communication section outputs the instruction signal to the transmitter.

11. The receiver of claim 10, wherein, if a detection signal indicating that the signal value falls within the predetermined range is generated by the detection section, the signal generation section generates an instruction signal instructing to stop changing the current amount of the driving current.

12. The receiver of claim 10, wherein if a detection signal indicating that the signal value is smaller than a lower limit value of the predetermined range is generated by the detection section, the signal generation section generates an 5 instruction signal instructing to increase the driving current.

13. The receiver of claim 10, wherein if a detection signal indicating that the signal value is greater than an upper 10 limit value of the predetermined range is generated by the detection section, the signal generation section generates an instruction signal instructing to decrease the driving current.

15 14. The receiver of claim 10, wherein the communication section includes a first terminal connected to the second end of the transmission line and a second terminal for being connected to a control signal line to output the instruction signal, the control signal line being different from the 20 transmission line.

15. The receiver of claim 10, wherein,

the transmitter is capable of transmitting a signal by
driving the transmission line with the predetermined driving
5 current; and

reception of a signal from the transmission line and
transmission of the instruction signal are performed by time
division.

10 16. The receiver of claim 10, wherein an output impedance
value of the transmitter driving the transmission line with
the predetermined driving current is smaller than an output
impedance value from the terminal portion to the signal
generation section.

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17. The receiver of claim 10, wherein a rate with which a
signal is transmitted when the receiver outputs the
instruction signal is slower than a rate with which the
driving current control section transmits a signal by driving
20 the transmission line.

18. The receiver of claim 10, wherein the transmission line is detachable from the communication section.

5 19. A transmitting-end interface to be used in a transmitter to be connected to a receiving-end interface of a receiver via a transmission line, the transmitter composing a signal transmission system together with the receiver, the transmitting-end interface comprising:

10 a communication section to be connected to a first end of the transmission line; and

a driving current control section for driving the transmission line with a predetermined amount of driving current, the driving current control section changing current

15 amount of the driving current based on a control signal,

wherein, as the control signal, the communication section receives from the receiver being connected to a second end of the transmission line an instruction signal for instructing whether or not to change the current amount of

20 the driving current, the instruction signal being generated

based on whether a signal value detected at the second end of the transmission line falls within a predetermined range or not.

5 20. The transmitting-end interface of claim 19, wherein the communication section includes a first terminal connected to the first end of the transmission line and a second terminal for being connected to a control signal line to receive the instruction signal, the control signal line being different
10 from the transmission line.

21. The transmitting-end interface of claim 19, wherein, the driving current control section is capable of transmitting a signal by driving the transmission line; and
15 transmission of a signal from the driving current control section and reception of the control signal are performed by time division.

22. The transmitting-end interface of claim 19, wherein an
20 output impedance value when the driving current control

section drives the transmission line is smaller than an output impedance value of the receiver outputting the instruction signal.

5 23. The transmitting-end interface of claim 19, wherein,
the driving current control section is capable of
transmitting a signal by driving the transmission line; and
a rate with which the driving current control section
transmits a signal is faster than a rate with which a signal
10 is transmitted when the receiver outputs the instruction
signal.

24. A receiving-end interface to be used in a receiver to be
connected to a transmitting-end interface of a transmitter
15 via a transmission line, the receiver composing a signal
transmission system together with the transmitter, the
transmitting-end interface being connected to a first end of
the transmission line, the receiving-end interface
comprising:

20 a communication section connected to a second end of the

transmission line, the communication section receiving a signal from the transmission line being driven with a predetermined driving current;

5 a detection section for detecting a signal value at the second end of the transmission line based on the signal received at the communication section, and for generating a detection signal indicating whether the signal value falls within a predetermined range or not; and

10 a signal generation section for, based on the detection signal, generating an instruction signal for instructing whether or not to change current amount of the driving current, wherein

the communication section outputs the instruction signal to the transmitter.

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25. The receiving-end interface of claim 24, wherein the communication section includes a first terminal connected to the second end of the transmission line and a second terminal for being connected to a control signal line to output the 20 instruction signal, the control signal line being different

from the transmission line.

26. The receiving-end interface of claim 24, wherein,

the transmitter is capable of transmitting a signal by

5 driving the transmission line with the predetermined driving current; and

reception of a signal from the transmission line and transmission of the instruction signal are performed by time division.

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27. The receiving-end interface of claim 24, wherein an

output impedance value of the transmitter driving the transmission line with the predetermined driving current is smaller than an output impedance value from the terminal

15 portion to the signal generation section.

28. The receiving-end interface of claim 24, wherein a rate

with which a signal is transmitted when the receiving-end

interface outputs the instruction signal is slower than a

20 rate with which the driving current control section transmits

a signal by driving the transmission line.

29. An interface system comprising the transmitting-end interface of claim 19 and the receiving-end interface of 5 claim 24, wherein the transmitting-end interface and the receiving-end interface are connected via the transmission line.

30. A transmitting-end chip to be connected to a receiving-end chip via a transmission line, the transmitting-end chip composing a signal transmission system together with the receiving-end chip, the transmitting-end chip comprising:
a communication section to be connected to a first end of the transmission line; and
15 a driving current control section for driving the transmission line with a predetermined amount of driving current, the driving current control section changing current amount of the driving current based on a control signal, wherein, as the control signal, the communication 20 section receives from the receiver being connected to a

second end of the transmission line an instruction signal for instructing whether or not to change the current amount of the driving current, the instruction signal being generated based on whether a signal value detected at the second end of 5 the transmission line falls within a predetermined range or not.

31. The transmitting-end chip of claim 30, wherein the communication section includes a first terminal connected to 10 the first end of the transmission line and a second terminal for being connected to a control signal line to receive the instruction signal, the control signal line being different from the transmission line.

15 32. The transmitting-end chip of claim 30, wherein, the driving current control section is capable of transmitting a signal by driving the transmission line; and transmission of a signal from the driving current control section and reception of the control signal are 20 performed by time division.

33. The transmitting-end chip of claim 30, wherein an output impedance value when the driving current control section drives the transmission line is smaller than an output 5 impedance value of the receiver outputting the instruction signal.

34. The transmitting-end chip of claim 30, wherein, the driving current control section is capable of 10 transmitting a signal by driving the transmission line; and a rate with which the driving current control section transmits a signal is faster than a rate with which a signal is transmitted when the receiver outputs the instruction signal.

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35. A receiving-end chip to be connected to a transmitting-end chip via a transmission line, the receiving-end chip composing a signal transmission system together with the transmitting-end chip, the transmitting-end chip being 20 connected to a first end of the transmission line, the

receiving-end chip comprising:

a communication section connected to a second end of the transmission line, the communication section receiving a signal from the transmission line being driven with a predetermined driving current;

a detection section for detecting a signal value at the second end of the transmission line based on the signal, and for generating a detection signal indicating whether the signal value falls within a predetermined range or not; and

10 a signal generation section for, based on the detection signal received at the communication section, generating an instruction signal for instructing whether or not to change current amount of the driving current, wherein
the communication section outputs the instruction signal
15 to the transmitter.

36. The receiving-end chip of claim 35, wherein the communication section includes a first terminal connected to the second end of the transmission line and a second terminal
20 for being connected to a control signal line to output the

instruction signal, the control signal line being different from the transmission line.

37. The receiving-end chip of claim 35, wherein,

5 the transmitter is capable of transmitting a signal by driving the transmission line with the predetermined driving current; and

 reception of a signal from the transmission line and transmission of the instruction signal are performed by time 10 division.

38. The receiving-end chip of claim 35, wherein an output impedance value of the transmitter driving the transmission line with the predetermined driving current is smaller than 15 an output impedance value from the terminal portion to the signal generation section.

39. The receiving-end chip of claim 35, wherein a rate with which a signal is transmitted when the receiving-end chip 20 outputs the instruction signal is slower than a rate with

which the driving current control section transmits a signal by driving the transmission line.

40. A chip-mounted board comprising the transmitting-end chip 5 of claim 30 and the receiving-end chip of claim 35, wherein the transmitting-end chip and the receiving-end chip are connected via the transmission line.

41. An impedance matching method for setting an output 10 impedance of a transmitter which is connected to a receiver via a transmission line and composes a signal transmission system together with the receiver, the transmitter including: a communication section to be connected to a first end of the transmission line; and a driving current control section for 15 driving the transmission line, the receiver being connected to a second end of the transmission line,

the method comprising the steps of:

operating the driving current control section to drive 20 the transmission line with a predetermined amount of driving current;

receiving, as a control signal for instructing whether or not to change the current amount of the driving current, an instruction signal generated based on whether a signal value detected at the second end of the transmission line 5 falls within a predetermined range or not; and changing the current amount of the driving current based on the control signal.

42. The impedance matching method of claim 41, wherein,
10 the communication section includes a first terminal connected to the first end of the transmission line and a second terminal connected to a control signal line, the control signal line being different from the transmission line; and
15 the step of receiving receives the instruction signal at the second terminal.

43. The impedance matching method of claim 41, wherein,
the step of driving operates the driving current control
20 section to transmit a signal by driving the transmission

line, and wherein

the method further comprises a step of performing, by time division, transmission of a signal from the driving current control section and reception of the control signal.

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44. The impedance matching method of claim 41, wherein an output impedance value when the driving current control section drives the transmission line is smaller than an output impedance value of the receiver outputting the 10 instruction signal.

45. The impedance matching method of claim 41, wherein, the step of driving operates the driving current control section to transmit a signal by driving the transmission 15 line; and

a rate with which the driving current control section transmits a signal is faster than a rate with which a signal is transmitted when the receiver outputs the instruction signal.

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46. An output impedance setting assisting method for, in a receiver which is connected to a transmitter via a transmission line and composes a signal transmission system together with the transmitter, assisting in setting an output impedance of the transmitter, the transmitter being connected to a first end of the transmission line, the receiver including: a communication section connected to a second end of the transmission line; and a detection section for detecting a signal value at a predetermined position,

10 the method comprising the steps of:

receiving, via the communication section, a signal from the transmission line being driven with a predetermined driving current;

15 detecting, by using the detection section, a signal value at the second end of the transmission line based on the signal;

generating a detection signal indicating whether the signal value falls within a predetermined range or not;

20 based on the detection signal, determining whether or not to change the current amount of the driving current with

which the transmission line is driven;

generating an instruction signal indicating the result of determination; and

5 outputting the instruction signal to the transmitter via the communication section.

47. The output impedance setting assisting method of claim 46, wherein,

the communication section includes a first terminal 10 connected to the second end of the transmission line and a second terminal connected to a control signal line, the control signal line being different from the transmission line; and

the step of receiving receives the instruction signal at 15 the second terminal.

48. The output impedance setting assisting method of claim 46, wherein,

the transmitter is capable of transmitting a signal by 20 driving the transmission line with the predetermined driving

current, and wherein

the method further comprises a step of performing, by time division, reception of a signal from the transmission line and transmission of the instruction signal.

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49. The output impedance setting assisting method of claim 46, wherein an output impedance value of the transmitter driving the transmission line with the predetermined driving current is smaller than an output 10 impedance value from the terminal portion to the signal generation section.

50. The output impedance setting assisting method of claim 46, wherein a rate with which a signal is transmitted 15 when the receiver outputs the instruction signal is slower than a rate with which the driving current control section transmits a signal by driving the transmission line.

51. A computer program to be executed in a transmitter which 20 is connected to a receiver via a transmission line and

composes a signal transmission system together with the receiver, the transmitter including: a communication section to be connected to a first end of the transmission line; and a driving current control section for driving the 5 transmission line, the receiver being connected to a second end of the transmission line,

the computer program comprising the steps of:
operating the driving current control section to drive the transmission line with a predetermined amount of driving 10 current;

causing the communication section to receive, as a control signal for instructing whether or not to change the current amount of the driving current, an instruction signal generated at the receiver based on whether a signal value 15 detected at the second end of the transmission line falls within a predetermined range or not; and

changing the current amount of the driving current based on the control signal.

20 52. The computer program of claim 51, wherein,

the communication section includes a first terminal connected to the first end of the transmission line and a second terminal connected to a control signal line, the control signal line being different from the transmission line; and

the instruction signal is received at the second terminal.

53. The computer program of claim 51, wherein,

10 the driving current control section is capable of transmitting a signal by driving the transmission line, and the transmitter is caused to perform, by time division, transmission of a signal from the driving current control section and reception of the control signal.

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54. The computer program of claim 51, wherein an output impedance value when the driving current control section drives the transmission line is smaller than an output impedance value of the receiver outputting the instruction signal.

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55. The computer program of claim 51, wherein,

the driving current control section is capable of transmitting a signal by driving the transmission line; and

5 a rate with which the driving current control section transmits a signal is faster than a rate with which a signal is transmitted when the receiver outputs the instruction signal.

10 56. A computer program to be executed in a receiver which is connected to a transmitter via a transmission line and composes a signal transmission system together with the transmitter, the transmitter being connected to a first end of the transmission line, the receiver including: a
15 communication section connected to a second end of the transmission line; and a detection section for detecting a signal value at a predetermined position,

the computer program comprising the steps of:

receiving, via the communication section, a signal from
20 the transmission line being driven with a predetermined

driving current;

detecting, by using the detection section, a signal value at the second end of the transmission line based on the signal;

5 generating a detection signal indicating whether the signal value falls within a predetermined range or not;

based on the detection signal, determining whether or not to change the current amount of the driving current with which the transmission line is driven;

10 generating an instruction signal indicating the result of determination; and

outputting the instruction signal to the transmitter via the communication section.

15 57. The computer program of claim 56, wherein,

the communication section includes a first terminal connected to the second end of the transmission line and a second terminal connected to a control signal line, the control signal line being different from the transmission

20 line; and

the instruction signal is received at the second terminal.

58. The computer program of claim 56, wherein,

5 the transmitter is capable of transmitting a signal by driving the transmission line with the predetermined driving current, and

the receiver is caused to perform, by time division, reception of a signal from the transmission line and
10 transmission of the instruction signal.

59. The computer program of claim 56, wherein an output impedance value of the transmitter driving the transmission line with the predetermined driving current is smaller than
15 an output impedance value from the terminal portion to the signal generation section.

60. The computer program of claim 56, wherein a rate with which a signal is transmitted when the receiver outputs the
20 instruction signal is slower than a rate with which the

driving current control section transmits a signal by driving
the transmission line.